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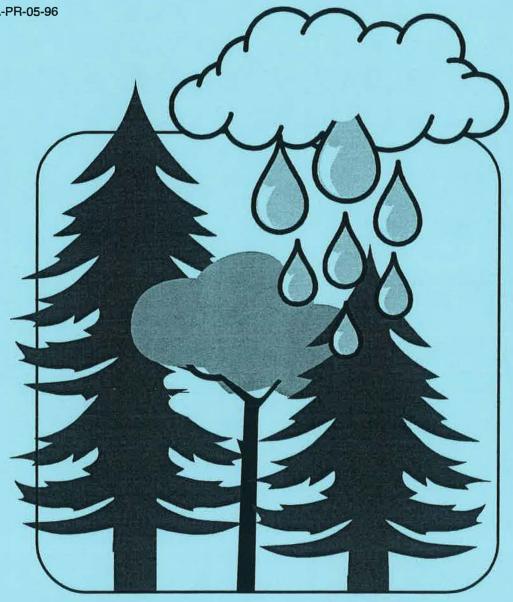
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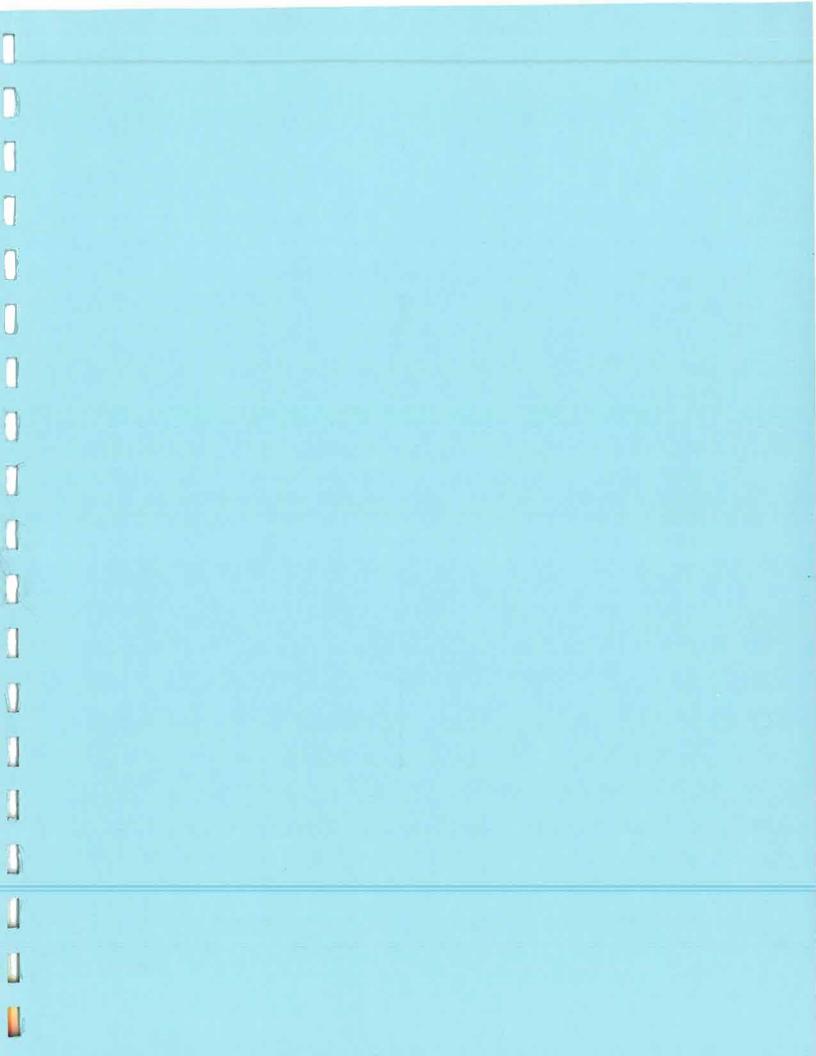
Northeastern Area

State & Private Forestry

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Forest Response Program Bibliography





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Introduction

The public's attitude toward air pollution in the United States evolved substantially during the 1960's. One of the results of the nation's emerging environmental ethic was the creation of the U.S. Environmental Protection Agency (EPA) in December of 1970. Prior to this time, research was focused on the impacts of air pollution on human health and welfare and was largely conducted by several Federal research agencies, which included the Department of Health, Education, and Welfare; the National Oceanic and Atmospheric Administration; and the U.S. Department of Agriculture. After the creation of the EPA, much of this work was consolidated in one regulatory agency, which resulted in periodic evaluations of the various effects of atmospheric pollution on human health, materials, agriculture, and forest ecosystems.

At the same time that environmental interest was growing in the United States, concern increased in the European scientific community and public over the ecological impacts of acidic deposition. As the magnitude of the damage to European lakes and streams and the widespread decline in Norway spruce and silver fir was reported, concern that similar problems were occurring in the United States increased substantially. This concern was heightened by press reports of high-elevation spruce-fir forest declines in the Adirondack and Appalachian Mountains and the decline and death of sugar maples in the north-eastern United States and Canada. During the early 1980's, it was not uncommon to read stories from respected news organizations quoting scientists as suggesting that our lakes and streams would soon be too acidic to support existing aquatic ecosystems and that much of the forests in the eastern United States were exhibiting symptoms of substantial decline and death.

During the early 1980's, acid deposition emerged as the dominant theme for air pollution research in the U.S. government. The National Acid Precipitation Assessment Program (NAPAP) was created by congressional action in 1979 to develop and implement an "acid rain" research strategy. NAPAP was a collaborative effort among several Federal agencies. It was organized around a series of work groups responsible for the effects on various aspects of the acid deposition problem. NAPAP was authorized for 10 years and scheduled for a culminating assessment in 1990. Because of the interagency nature of the program, significant compromises and accommodations had to be made during the initial stages of research funding and implementation. One consequence of difficulties encountered in implementing such a large national research program was the five-year delay in starting the Forest Response Program (FRP). The FRP was a joint interagency research program initiated in 1985 between the USDA Forest Service and the U.S. EPA. Additional financial support for the FRP came from the National Council of the Forest Industry for Air and Stream Improvement, Coal Producers, and the Electric Power Research Institute. The FRP was organized into four regional research cooperatives to address three principal policy questions: (1) Is there a significant problem of forest damage in North America that might be caused by acid deposition alone or in combination with other pollutants; (2) What is the causal relationship between air pollutants and forest damage; and (3) On a stand or regional basis, what is the dynamic relationship between air pollutants and forest damage?

As is often the case with Federally-funded research, events overtook the timeframe of the Forest Response Program. The relatively slow start of the program combined with the scientific challenge of testing hypotheses on long-lived perennial trees within five years proved a major challenge to the scientific community. At the time of the enactment of the Clean Air Act Amendments, only the first policy question could be addressed in any significant way. The scientific results that would address the remaining two policy questions were barely underway before the enactment of the Clean Air Act Amendments.

In spite of the inability of scientific inquiry to meet political schedules, much important work has been accomplished to elucidate the relative impacts of acidic deposition and other air pollutants on forest ecosystems. Different environmental conditions, forest types, species sensitivities, occurrences of natural stressors such as drought, disease, and insect activity, and pollution patterns suggest that pollutant effects may vary around the country. To focus on problems most germane to specific areas, the FRP organized regional research cooperatives. Four cooperatives corresponding to major forest types or regions were established: spruce-fir, southern commercial, eastern hardwoods, and western conifers. Supporting groups included the Atmospheric Exposure Coop, National Vegetation Survey, Synthesis and Integration, Quality Assurance, and National Program Management. This document lists the publications generated by these entities.

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